

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A system ~~System~~ for controlling an audio spatialisation in real time, comprising:

[-] input means [(50)] for accessing an audio stream composed of a plurality of audio sources associated to audio tracks[.];

[-] constraint means [(3)] for receiving and processing constraints expressing rules for a spatialisation of said audio stream[.]; and

[-] interface means [(2)] for entering spatialising commands to said constraint means,

~~characterised in that~~ wherein said interface means [(2)] presents at least one user input for effecting a grouped spatialisation command, said command acting on a specified group of audio sources, and

said constraint means [(3)] is programmed to process said group of audio sources as a unitary object for the application of said constraint variables.

Claim 2 (Currently Amended): The system ~~System~~ according to claim 1, wherein said group of audio sources is identified with a respective group of individually accessible audio tracks.

Claim 3 (Currently Amended): The system ~~System~~ according to claim 1, wherein said group of audio sources reflects an internal coherence with respect to said rules for spatialisation.

Claim 4 (Currently Amended): The system ~~System~~ according to claim 1, wherein said interface means $[(2)]$ is adapted to display:

$[-]$ at least one group icon $[(H)]$ representing a grouped spatialisation command, said icon being positioned according to a topology reflecting a spatialisation and being displaceable by a user, and

$[-]$ links between said icons expressing constraints to be applied between said group icons.

Claim 5 (Currently Amended): The system ~~System~~ according to claim 1, further adapted to process global commands through said interface means $[(2)]$ involving a plurality of groups of audio sources simultaneously.

Claim 6 (Currently Amended): The system ~~System~~ according to claim 5, wherein said global commands comprise at least one among:

$[-]$ a balance between a plurality of groups of audio sources (~~e.g. between two groups respectively corresponding to acoustic and synthetic components~~), and

$[-]$ a volume level, whereby positions of groups can be changed simultaneously in a proportional manner.

Claim 7 (Currently Amended): The system ~~System~~ according to claim 1, wherein said constraints are one-way constraints, each constraint having a respective set of input and output variables $[(V)]$ entered by a user through said interface $[(2)]$.

Claim 8 (Currently Amended): The system ~~System~~ according to claim 1, further adapted to provide a program mode for the recording of mixing constraints entered through

said interface means $[(2)]$ in terms of constraint parameters operative on said groups of audio sources and components of said groups.

Claim 9 (Currently Amended): The system ~~System~~ according to claim 8, wherein said interface means $[(2)]$ is adapted to present each said constraint by a corresponding icon such that they can be linked graphically to an object to be constrained through displayed connections.

Claim 10 (Currently Amended): The system ~~System~~ according to claim 1, wherein said constraints are recorded in terms of metadata associated with said audio stream.

Claim 11 (Currently Amended): The system ~~System~~ according to claim 1, wherein each constraint is configured as a data string containing a variable part and a constraint part.

Claim 12 (Currently Amended): The system ~~System~~ according to claim 11, wherein said variable part expresses at least one among:

$[-]$ a variable type, indicating whether it acts on an audio track or said group,

$[-]$ track identification data,

$[-]$ a variable name,

$[-]$ a variable icon,

$[-]$ individual loudness (~~for track variables~~),

$[-]$ initial position data (~~x,y coordinates~~).

Claim 13 (Currently Amended): The system ~~System~~ according to claim 11, wherein said constraint part expresses at least one among:

- [[-]] a constraint type,
- [[-]] constrained variables (~~identification of individual tracks~~),
- [[-]] a list of input variables,
- [[-]] a list of output variables,
- [[-]] constraint position,
- [[-]] constraint orientations.

Claim 14 (Currently Amended): The system ~~System~~ according to claim 1, wherein multiple audio sources for said spatialisation are accessed from a common recorded storage medium (~~optical disk, hard disk~~).

Claim 15 (Currently Amended): The system ~~System~~ according to claim 14, wherein said constraints are accessed from said common recorded medium as metadata.

Claim 16 (Currently Amended): The system ~~System~~ according to claim 15, wherein said metadata and said tracks in which said audio stream is recorded are accessed from a common file, ~~e.g. in accordance with the WAV format~~.

Claim 17 (Currently Amended): The system ~~System~~ according to claim 1, further comprising an audio data and metadata decoder for accessing from a common file audio data and metadata expressing said constraints and recreating therefrom :

- [[-]] a set of audio streams from each individual track contained in said file, and
- [[-]] the specification of said metadata from an encoded format of said file.

Claim 18 (Currently Amended): The system ~~System~~ according to claim 1, implemented as an interface to a computer operating system and a sound card.

Claim 19 (Currently Amended): The system ~~System~~ according to claim 1, cooperating with a sound card and three-dimensional audio buffering means, said buffering means being physically located in a memory of said sound card so as to benefit from three-dimensional acceleration features of said card.

Claim 20 (Currently Amended): The system ~~System~~ according to claim 19, further comprising a waitable timer for controlling writing tasks into said buffering means.

Claim 21 (Currently Amended): The system ~~System~~ according to claim 1, wherein said input means is adapted to access audio tracks of said audio stream which are interlaced in a common file.

Claim 22 (Currently Amended): The system ~~System~~ according to claim 1, adapted to cooperate with a three-dimensional sound buffer for introducing an orientation constraint.

Claim 23 (Currently Amended): The system ~~System~~ according to claim 1, wherein said constraints comprise functional and/or inequality constraints, wherein cyclic constraints are processed through a propagation algorithm by merely checking conflicts.

Claim 24 (Currently Amended): The system ~~System~~ according to claim 1, further comprising a means for encoding individual sound sources and a database describing the constraints and relating constraint variables into a common audio file through interlacing.

Claim 25 (Currently Amended): The system ~~System~~ according to claim 24, further comprising means for decoding said common audio file in synchronism with said encoding means.

Claim 26 (Currently Amended): The system ~~System~~ according to claim 1, further comprising:

a constraint system module for inputting a database describing the constraints and relating constraint variables for each music title, thereby creating spatialisation commands; and

a spatialisation controller module for inputting said set of audio streams given by encoding means, and spatialisation commands given by said constraint system module.

Claim 27 (Currently Amended): The system ~~System~~ according to claim 26, further comprising three-dimensional sound buffer means, in which a writing task and a reading task for each sound source are synchronised, said means thereby relaying said audio stream coming from an audio file into a spatialisation controller module and relaying said database describing the constraints and relating constraint variables for each music title into said constraint module means.

Claim 28 (Currently Amended): The system ~~System~~ according to claim 26, wherein said spatialisation controller module further comprises a scheduler means for connecting said constraint system module and said spatialisation controller module.

Claim 29 (Currently Amended): The system ~~System~~ according to claim 27, wherein said spatialisation controller module comprises static audio secondary buffer means.

Claim 30 (Currently Amended): The system ~~System~~ according to claim 27, further comprising a timer means for waking up said writing task at predetermined intervals.

Claim 31 (Currently Amended): The system ~~System~~ according to claim 26, wherein said spatialisation controller module is a remote controllable mixing device.

Claim 32 (Currently Amended): The system ~~System~~ according to claim 1, wherein said constraint means $[(3)]$ is configured to execute a test algorithm.

Claim 33 (Currently Amended): A spatialisation apparatus comprising :
 $[-]$ a personal computer having a data reader for reading from a common data medium both audio stream data and data representative of constraints for spatialisation, and
 $[-]$ an audio spatialisation system according to claim 1 having its input means adapted to receive data from said data reader.

Claim 34 (Currently Amended): The spatialisation ~~Spatialisation~~ apparatus according to claim 33, wherein said computer comprises a three-dimensional sound buffer for storing contents extracted from data reader.

Claim 35 (Currently Amended): The spatialisation ~~Spatialisation~~ apparatus according to claim 34, wherein said sound buffer is controlled through a dynamic link library (DLL).

Claim 36 (Previously Presented): A storage medium containing data specifically adapted for exploitation by an audio spatialisation control system according to claim 1, comprising a plurality of tracks forming an audio stream and data representative of said processing constraints.

Claim 37 (Currently Amended): The storage ~~Storage~~ medium according to claim 36, wherein said data representative of said processing constraints and said plurality of tracks are recorded in a common file.

Claim 38 (Currently Amended): The storage ~~Storage~~ medium according claim 36, wherein said data representative of said processing constraints are recorded as metadata with respect to said tracks.

Claim 39 (Currently Amended): The storage ~~Storage~~ medium according to claim 36, wherein said tracks are interlaced.

Claim 40 (Currently Amended): The storage ~~Storage~~ medium according to claim 35, in the form of any digital storage medium, ~~such as a CD-ROM, DVD-ROM or minidisk.~~

Claim 41 (Currently Amended): The storage ~~Storage~~ medium according to claim 36 in the form of a computer hard disk.

Claim 42 (Previously Presented): A computer program product loadable into the internal memory unit of a general-purpose computer, comprising a software code unit for

coding the system according to claim 1 and implementing the means described in said system, when said computer program product is run on a computer.

Claim 43 (Currently Amended): A method of controlling an audio spatialisation, comprising ~~the steps of~~:

[[-]] accessing an audio stream composed of a plurality of audio sources associated to audio tracks,

[[-]] receiving and processing constraints expressing rules for a spatialisation of said audio stream, and

[[-]] entering spatialising commands to said constraint means through an interface, ~~characterised in that~~ wherein at least one user input is provided for effecting a grouped spatialisation command, said command acting on a specified group of audio sources, and

said group of audio sources is processed as a unitary object for the application of said constraint variables.